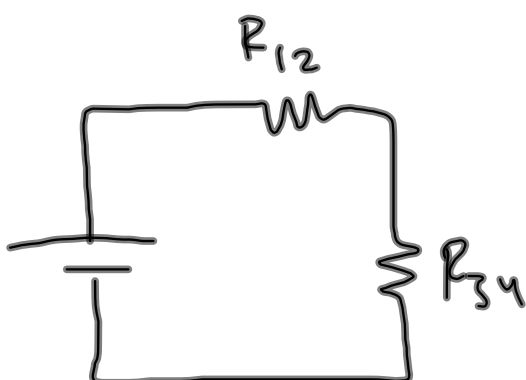
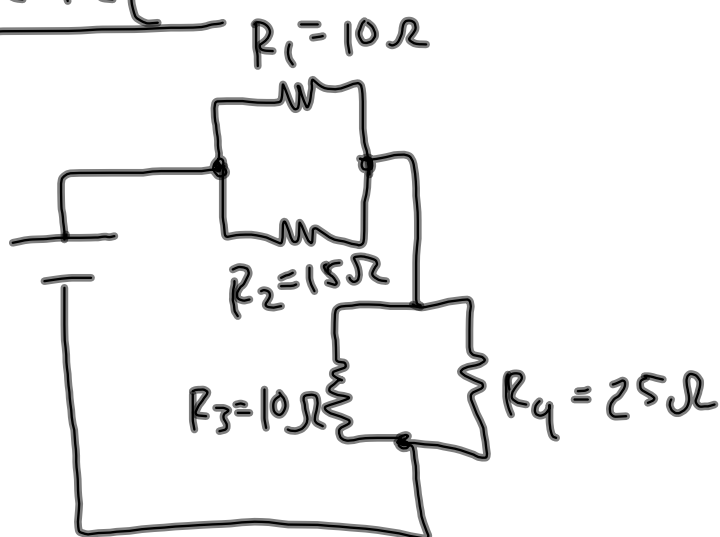


find  $R_{eq}$ :

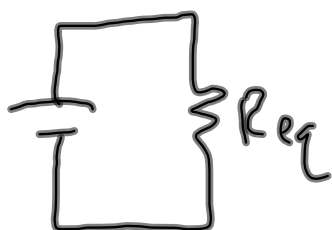


$$\frac{1}{R_{12}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R_{12} = 6\Omega$$

$$\frac{1}{R_{34}} = \frac{1}{R_3} + \frac{1}{R_4}$$

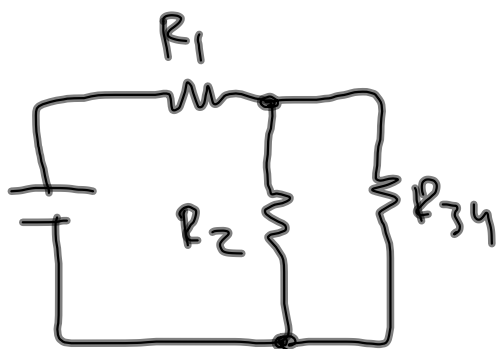
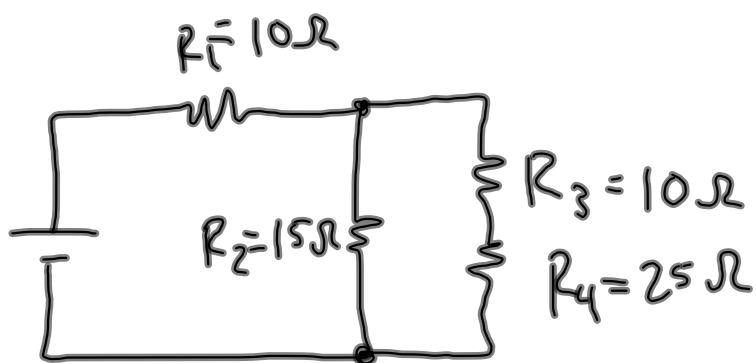
$$R_{34} = 7.14\Omega$$



$$R_{eq} = R_{12} + R_{34}$$

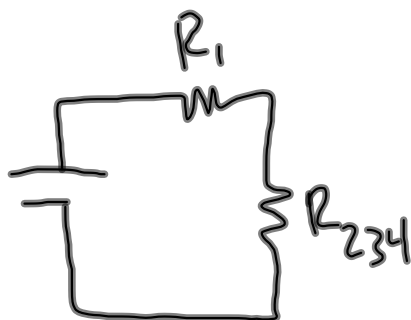
$$= 13.14\Omega$$

find  $R_{eq}$ :



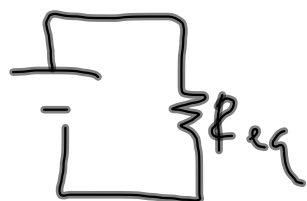
$$R_{34} = R_3 + R_4$$

$$= 35\Omega$$



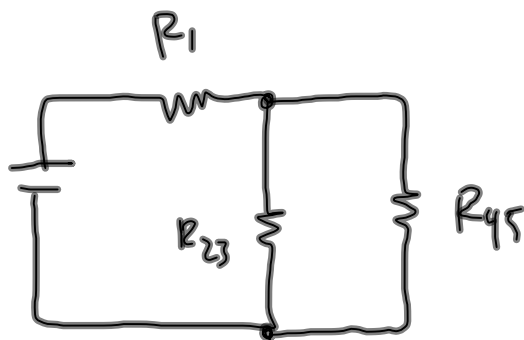
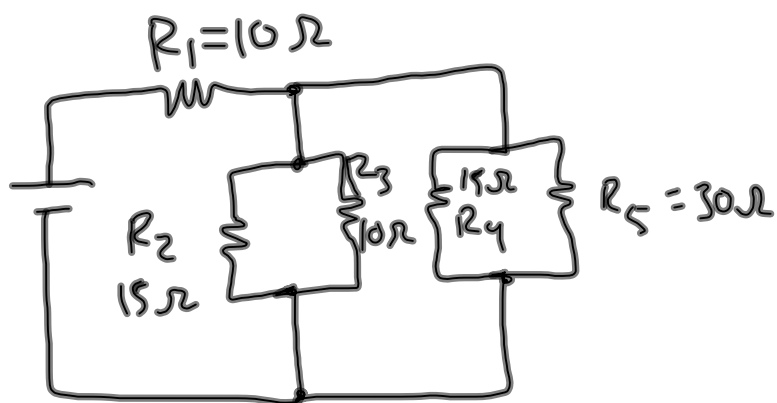
$$\frac{1}{R_{234}} = \frac{1}{R_2} + \frac{1}{R_{34}}$$

$$R_{234} = 10.5\Omega$$



$$R_{eq} = R_1 + R_{234}$$

$$= 20.5\Omega$$

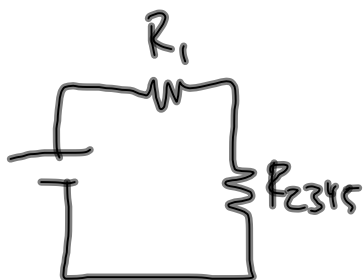
find  $R_{eq}$ :

$$R_{23} = \left[ \frac{1}{R_2} + \frac{1}{R_3} \right]^{-1}$$

$$= 6 \, \Omega$$

$$R_{45} = \left[ \frac{1}{R_4} + \frac{1}{R_5} \right]^{-1}$$

$$= 10 \, \Omega$$



$$R_{2345} = \left[ \frac{1}{R_{23}} + \frac{1}{R_{45}} \right]^{-1}$$

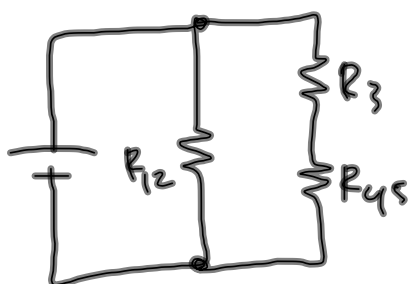
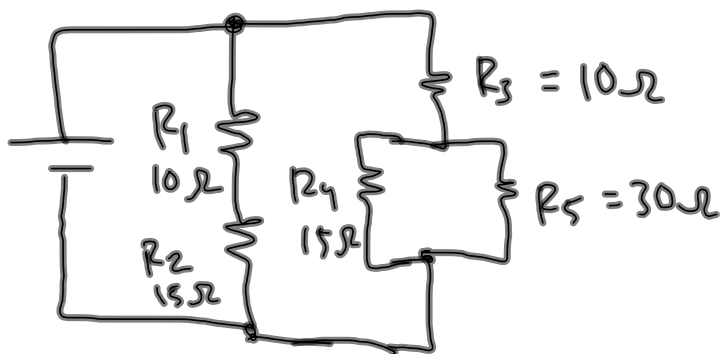
$$= 3.75 \, \Omega$$



$$R_{eq} = R_1 + R_{2345}$$

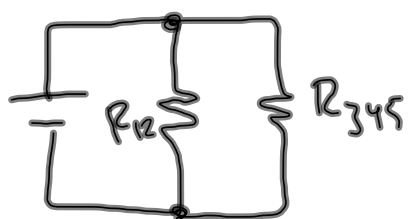
$$= 13.75 \, \Omega$$

Find  $R_{eq}$ :

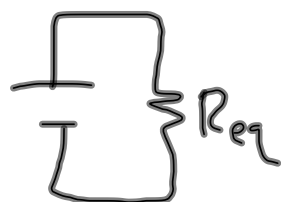


$$R_{12} = R_1 + R_2 \\ = 25\Omega$$

$$R_{45} = \left[ \frac{1}{R_4} + \frac{1}{R_5} \right]^{-1} \\ = 10\Omega$$



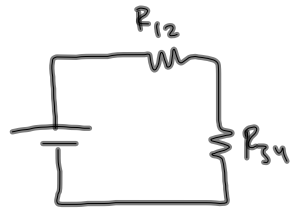
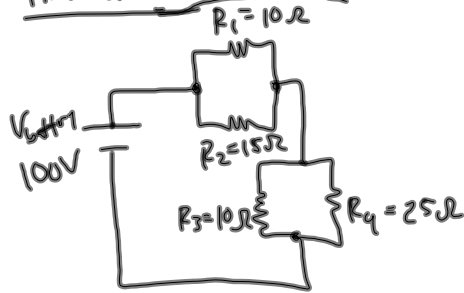
$$R_{345} = R_3 + R_{45} \\ = 20\Omega$$



$$R_{eq} = \left[ \frac{1}{R_{12}} + \frac{1}{R_{345}} \right]^{-1} \\ = 11.1\Omega$$

# Practice Equivalent Resistance and Full Circuit Problems 5.11.12 Honors Physics

find all I's and V's:

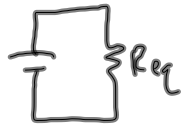


$$\frac{1}{R_{12}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R_{12} = 6 \Omega$$

$$\frac{1}{R_{34}} = \frac{1}{R_3} + \frac{1}{R_4}$$

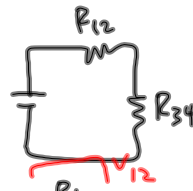
$$R_{34} = 7.14 \Omega$$



$$R_{eq} = R_{12} + R_{34}$$

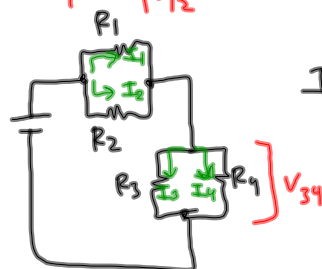
$$= 13.14 \Omega$$

$$I_{total} = \frac{V_{battery}}{R_{eq}} = 7.61 A$$



$$V_{12} = I_{total} R_{12} = 45.66 V$$

$$V_{34} = I_{total} R_{34} = 54.34 V$$



$$I_1 = \frac{V_{12}}{R_1} = 4.56 A$$

$$I_2 = \frac{V_{12}}{R_2} = 3.04 A$$

$$I_3 = \frac{V_{34}}{R_3} = 5.43 A$$

$$I_4 = \frac{V_{34}}{R_4} = 2.17 A$$

$$V_1 = 45.66 V \quad I_1 = 4.56 A$$

$$V_2 = 45.66 V \quad I_2 = 3.04 A$$

$$V_3 = 54.34 V \quad I_3 = 5.43 A$$

$$V_4 = 54.34 V \quad I_4 = 2.17 A$$